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(w)

5 at least one winding for conducting welding current, said first and second pole pieces each having and end surface, said air gap defined between said end surfaces of said first and second pole pieces, each end surfaces including two outer edges and a middle portion positioned there between, at least one of said middle portions being substantially V-shaped, said air gap having a width between said middle portions of said first and second pole pieces that is greater than a width between either of said outer edges of said first and second pole pieces, said air gap having a configuration which results in said inductance of said choke gradually changing with an output current of the welder without 10 saturation in said air gap thereby eliminating inflection points during operation of said welder, said at least one winding and said core having a size to prevent saturation at a weld current of at least about 100 amperes.

30. (Amended) The output choke as defined in claim 29, wherein both said middle portions being substantially V-shaped.

31. (Twice Amended) The output choke as defined in claim 29, wherein said air gap is substantially diamond shaped.

32. (Amended) The output choke as defined in claim 29, wherein said middle portions of said end surfaces of said first and second pole pieces having substantially the same shape.

33. (Amended) An output choke for a D.C. arc welder having an inductance and adapted to include at least one winding for conducting current, said output choke comprising a high

permeability core having first and second pole pieces and an inductance controlling air gap, said first  
and second pole pieces each having an end surface, said air gap defined between said end surfaces  
of said first and second pole pieces, each of said end surfaces including outer edges and a middle  
portion positioned there between, at least one of said middle portions being substantially V-shaped,  
said air gap having a width between said middle portions of said end surfaces of said first and second  
pole pieces that is greater than a width between at least one pair of said outer edges of said end  
surfaces of said first and second pole pieces, said air gap having a configuration which results in said  
10 inductance of said choke changing with an output current of the welder without saturation in said  
air gap thereby substantially eliminating inflection points during operation of said welder.

46. (Amended) The output choke as defined in claim 40, wherein said at least a portion  
of the middle portion of said corresponding end surfaces being spaced apart at a varying distance to  
substantially gradually vary the inductance of said choke over substantially a complete current range  
of said choke.

54. (Amended) The output choke as defined in claim 53, wherein said outer edges of said  
end surfaces of said first and second pole pieces being spaced apart at substantially the same  
distance.

58. (Twice Amended) An output choke for a D.C. arc welder having an inductance and  
adapted to include at least one winding for conducting current, said output choke comprising a high  
permeability core having first and second pole pieces and an inductance controlling air gap, said air

gap defined by an end surface on said first and second pole pieces, at least a portion of said end  
5 surfaces of said first and second pole pieces being spaced from one another and facing one another,  
*DH CWT*  
said end surfaces of said first and second pole pieces each having outer edges and a middle portion  
between said outer edges, at least a portion of the middle portion of said corresponding end surfaces  
being spaced apart at a varying distance to vary the inductance of said choke over a current range,  
said air gap having a converging width that at least partially converges toward said outer edges, at  
10 least a portion of said air gap having a width that is greater than the spacing between either the [inner  
and] outer edges of said first and second pole pieces, said middle portions having a configuration to  
substantially prevent inflection points along a saturation curve of said choke.

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59. (Amended) The output choke as defined in claim 58, wherein said middle portions  
having substantially non-perpendicular oriented surfaces.

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62. (Amended )The output choke as defined in claim 58, wherein at least one of said  
middle portions being substantially V-shaped.

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64. (Amended) The output choke as defined in claim 58, wherein at least one of said  
middle portions being substantially arcuate shaped.

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68. (Amended) The output choke as defined in claim 58, wherein said at least a portion  
of the middle portion of said corresponding end surfaces being spaced apart at a varying distance to

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Cont

substantially gradually vary the inductance of said choke over substantially a complete current range of said choke.

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77. (Amended) The output choke as defined in claim 58, wherein said output choke adapted to charge a capacitor.

Add the following new claims:

Rule 1.12b  
D10  
1178. An output choke for a D.C. arc welder having an inductance comprising a high permeability core having first and second pole pieces and an inductance controlling air gap, said first and second pole pieces each having an end surface, said air gap defined between said end surfaces of said first and second pole pieces, each of said end surfaces including two outer edges and a middle portion positioned there between, each of said middle portions being substantially V-shaped to form a substantially diamond shaped air gap between said middle portions, said air gap having a configuration and being spaced apart at a varying distance resulting in said inductance of said choke changing with an output current of the welder without saturation in said air gap thereby substantially eliminating inflection points during operation of said welder and substantially gradually varying the inductance of said choke over substantially a complete current range of said choke.

72.  
78. The output choke as defined in claim 78, wherein said diamond shaped air gap is substantially symmetrical.

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80.

81. The output choke as defined in claim <sup>78</sup> 85, wherein said choke includes at least one winding for conducting welding current, said at least one winding and said core having a sufficient size to prevent saturation at a weld current of at least about 100 amperes.

81.

88. The output choke as defined in claim <sup>78</sup> 78, wherein said air gap has a configuration that causes said inductance of said choke to gradually vary over a current range in an inverse relationship with a weld current.

82.

89. The output choke as defined in claim <sup>80</sup> 87, wherein said air gap has a configuration that causes said inductance of said choke to gradually vary over a current range in an inverse relationship with a weld current.

83.

90. The output choke as defined in claim <sup>78</sup> 78, wherein said air gap is filled with a low permeability material.

84.

91. The output choke as defined in claim <sup>82</sup> 89, wherein said air gap is filled with a low permeability material.



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1	<u>CTNF</u>	8
2	1449	1

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